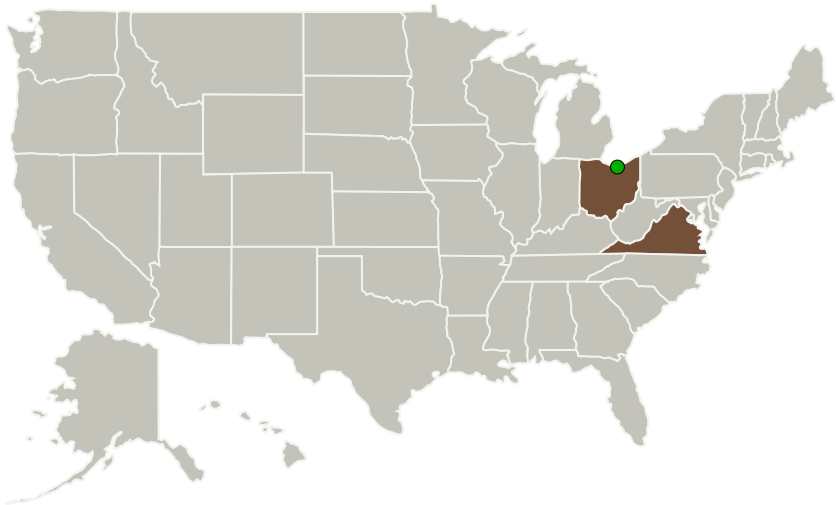
Tactile Data Entry System, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Barron Associates, in partnership with the University of Washington, proposes integrating a small vibrating element into an EVA glove to create a surrogate for the tactile sense lost behind the insulating and protective layers. This vibrotactile display will stimulate the neuro-receptors in the user's fingertips, with various waveforms, or "tactors," conveying sensations such as impact or surface roughness. By restoring the sense of touch to gloved crewmembers, the system will demonstrate increased performance and reduced user fatigue compared to conventional data entry systems. The proposed technology enables user interfaces that are adaptable to a wide range of tasks, including surface navigation, document editing, communications, and telerobotic control. The Phase I prototype is a pathfinder, overcoming technical hurdles and reducing risks, for an evolved system compatible with integration into future NASA concepts for EVA suits. The prototype targets two key technological challenges to an operational system: tactile cueing and motion sensing. The proposed effort will demonstrate the feasibility of integrating these systems into advanced EVA concepts, and examine the benefit of tactile cueing for relevant data entry tasks. The Phase I program builds a foundation for potential Phase II demonstration of an advanced tactile EVA data entry system by suited crewmembers on the ISS. At the end of Phase I, NASA will be able to make an informed decision on the merits of proceeding to on-orbit evaluation.

Primary U.S. Work Locations and Key Partners



Tactile Data Entry System, Phase I

Table of Contents

Tactile Data Entry System, Phase I

Completed Technology Project (2010 - 2010)

Organizations Performing Work	Role	Type	Location
Barron Associates, Inc.	Lead Organization	Industry	Charlottesville, Virginia
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/141314)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Barron Associates, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

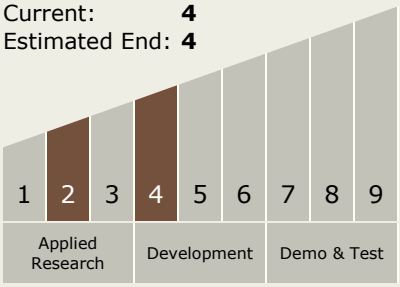
Carlos Torrez

Principal Investigator:

Richard Adams

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Tactile Data Entry System, Phase I

Completed Technology Project (2010 - 2010)

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.4 Human-Robot Interaction
    - TX04.4.2 Distributed Collaboration and Coordination

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System